

In the Drawings

FIGS. 1E-1H are amended to add the label designating them as "Prior Art," as shown in the accompanying annotated and replacement sheets.

Attachments

Annotated Sheets

Replacement Sheets

REMARKS

The Examiner is thanked for the thorough examination of the present application. The Office Action, however, has tentatively rejected all claims 1-15. For at least the reasons set forth below, Applicant respectfully requests reconsideration and withdrawal of the rejections.

The Office Action objected to FIGS. 1E-1H. Applicant has amended these drawings to correct the noted informalities.

Rejections Under 35 U.S.C. 102(b) of Claims 1 and 9

Turning now to the substantive rejections, claims 1 and 9 stand rejected under 35 U.S.C. 102(b) as allegedly anticipated by Okada et al (USPN 6,514,860 hereinafter "Okada"). Claims 1 and 9 are independent claims, from which claims 2-8 and 10-15 respectively depend. Applicant asserts that claims 1 and 9 are patentable for the reasons discussed below and, for at least the same reasons, claims 2-8 and 10-15 are also patentable.

The Office Action alleges that "Okada" discloses the method of forming a dual damascene interconnect in an integrated circuit as claims 1 and 9 recited. Applicant respectfully disagrees.

Claim 1 recites:

1. A method of forming a dual damascene interconnect in an integrated circuit comprising:

providing a substrate having a first etched region therein;
filling said first etched region with a protective layer;
coating said protective layer with a resist layer;

patterning said resist layer and said protective layer to define an opening encompassing said first etched opening wherein said protective layer is recessed within said first etched opening;

thereafter forming a second etched region encompassing a top portion of said first etched region;

thereafter removing said resist layer and said protective layer; and thereafter filling said first and second etched regions with a conductive material to complete formation of said interconnect.

(*Emphasis Added*). Claim 1 patently defines over the cited reference for at least the reason that Okada fails to disclose at least the features emphasized above.

As emphasized above, claim 1 defines a method of forming a dual damascene interconnect that comprises **patterning** the resist layer and the protective layer to define an opening encompassing the first etched opening.

In contrast, Okada teaches (in column 9, lines 44-49 and FIGS. 3G-3H):

“In one aspect of the invention, *the organic fill material 148 can be removed using an oxidization process*. The parameters of oxidization processes, also known as light **ashing**, are well known by those having ordinary skill in the art, and the invention is not limited as to particular process parameters.”

The protective layer recited in claim 1 is patterned to define an opening. However, the organic fill material 148 recited in “Okada” is removed by ashing. **“Ashing,” however, is not a patterning process**, as will be appreciated by persons skilled in the art. For at least this reason, Okada does not anticipate the embodiments of claim 1, and reconsideration of this rejection is hereby respectfully requested.

Likewise, independent claim 9 recites:

9. A method of forming a dual damascene interconnect in an integrated circuit comprising:
providing a substrate having a first etched region therein;
filling said first etched region with a bottom antireflective coating (BARC) layer;
coating said BARC layer with a resist layer;
patterning said resist layer and said BARC layer to define an opening encompassing said first etched opening wherein said BARC layer is recessed within said first etched opening;

thereafter forming a second etched region encompassing a top portion of said first etched region;
thereafter removing said resist layer and said BARC layer; and
thereafter filling said first and second etched regions with a conductive material to complete formation of said interconnect.

(Emphasis Added)

Like claim 1, claim 9 defines a method forming a dual damascene interconnect in an integrated circuit in claim 1 comprising **patterning** the resist layer and the BARC layer to define an opening encompassing the first etched opening. However, as noted above, the organic fill material 148 disclosed in “Okada” is removed by **ashing**. Therefore, reconsideration of the rejection of claim 9 is respectfully requested for at least the same reasons as claim 1.

Hence it is believe that claims 1 and 9 are allowable over the cited reference (Okada et al). Insofar as claims 2-8 and 10-15 respectively depend from claim 1 and claim 9, these claims are also allowable at least by virtue of their dependency.

The Office Action also rejected claim 7 under 35 U.S.C. § 103(a) as allegedly unpatentable over the combination of Okada in view of U.S. patent 6,861,347 to Lee. Applicant respectfully disagrees, for at least the reason that the Office Action failed to identify a proper suggestion or motivation to combine the select teachings from each of these two references. In combining these references, the Office Action stated only that the combination would have been obvious “in order to simplify the process of creating the via hole because it has a low etching selectivity to insulating layer.” (Office Action, page 7). This alleged motivation is clearly improper in view of well-established Federal Circuit precedent.

It is well-settled law that in order to properly support an obviousness rejection under 35 U.S.C. § 103, there must have been some teaching in the prior art to suggest to one skilled in the art

that the claimed invention would have been obvious. W. L. Gore & Associates, Inc. v. Garlock Thomas, Inc., 721 F.2d 1540, 1551 (Fed. Cir. 1983). More significantly,

"The consistent criteria for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that this [invention] should be carried out and would have a reasonable likelihood of success, viewed in light of the prior art. ..." Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure... In determining whether such a suggestion can fairly be gleaned from the prior art, the full field of the invention must be considered; for the person of ordinary skill in the art is charged with knowledge of the entire body of technological literature, including that which might lead away from the claimed invention."

(*Emphasis added.*) In re Dow Chemical Company, 837 F.2d 469, 473 (Fed. Cir. 1988).

In this regard, Applicant notes that there must not only be a suggestion to combine the functional or operational aspects of the combined references, but that the Federal Circuit also requires the prior art to suggest both the combination of elements and the structure resulting from the combination. Stiftung v. Renishaw PLC, 945 Fed.2d 1173 (Fed. Cir. 1991). Therefore, in order to sustain an obviousness rejection based upon a combination of any two or more prior art references, the prior art must properly suggest the desirability of combining the particular elements to derive a method of forming a dual damascene structure, as claimed by the Applicant.

When an obviousness determination is based on multiple prior art references, there must be a showing of some "teaching, suggestion, or reason" to combine the references. Gambro Lundia AB v. Baxter Healthcare Corp., 110 F.3d 1573, 1579, 42 USPQ2d 1378, 1383 (Fed. Cir. 1997) (also noting that the "absence of such a suggestion to combine is dispositive in an obviousness determination").

Evidence of a suggestion, teaching, or motivation to combine prior art references may flow, inter alia, from the references themselves, the knowledge of one of ordinary skill in the art, or from

the nature of the problem to be solved. See In re Dembiczak, 175 F.3d 994, 1000, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). Although a reference need not expressly teach that the disclosure contained therein should be combined with another, the showing of combinability, in whatever form, must nevertheless be "clear and particular." Dembiczak, 175 F.3d at 999, 50 USPQ2d at 1617.

If there was no motivation or suggestion to combine selective teachings from multiple prior art references, one of ordinary skill in the art would not have viewed the present invention as obvious. See In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998); Gambro Lundia AB, 110 F.3d at 1579, 42 USPQ2d at 1383 ("The absence of such a suggestion to combine is dispositive in an obviousness determination.").

Significantly, where there is no apparent disadvantage present in a particular prior art reference, then generally there can be no motivation to combine the teaching of another reference with the particular prior art reference. Winner Int'l Royalty Corp. v. Wang, No 98-1553 (Fed. Cir. January 27, 2000). The rationales relied on by the Office Action in the present application are merely generic statements, that have nothing to do specifically with the structures disclosed in the other references. As such, these rationales cannot be properly viewed as proper motivations for combining the specific teachings of the individual references. Indeed, the generic motivations advanced by the present Office Action could be used to support a combination of ANY references, which is clearly contra to the cited Federal Circuit precedent and the clear intent of 35 U.S.C. § 103. For at least the additional reason that the Office Action failed to identify proper motivations or suggestions for combining the various references to properly support the rejections under 35 U.S.C. § 103, those rejections should be withdrawn.

No fee is believed to be due in connection with this amendment and response. If, however, any fee is deemed to be payable, you are hereby authorized to charge any such fee to Deposit Account No. 20-0778.

Respectfully submitted ,

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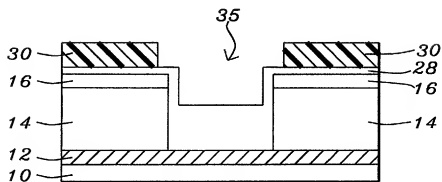


FIG. 1E - prior Art

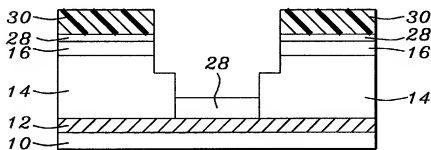


FIG. 1F ~ prior Art

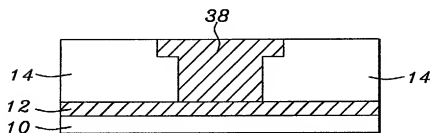


FIG. 1G - prior Art

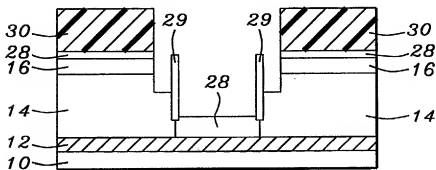


FIG. 1H - prior Art